

NON-PUBLIC?: N
ACCESSION #: 9502280424
LICENSEE EVENT REPORT (LER)

FACILITY NAME: North Anna Power Station Unit 1 PAGE: 1 OF 4

DOCKET NUMBER: 05000338

TITLE: ESF ACTUATION DUE TO AUTOMATIC REACTOR TRIP ON LOW FLOW
IN THE REACTOR COOLANT SYSTEM "B" LOOP
EVENT DATE: 01/27/95 LER #: 95-001-00 REPORT DATE: 02/23/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Mr. J. A. Stall TELEPHONE: (703) 894-2101

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On January 27, 1995, at 1601 hours, with Unit 1 in Mode 1, 100 percent power, an automatic reactor trip occurred. The reactor trip initiating signal was low flow in the 'B' reactor coolant loop with greater than thirty (30) percent power. This resulted in a reactor and turbine trip. A four (4) hour report was made to the NRC Operations Center at 1740 hours in accordance with 10 CFR 50.72 (b)(2)(ii). This event is reportable pursuant to 10 CFR 50.73 (a)(2)(iv) for a condition that resulted in an automatic actuation of any engineered safety feature (ESF), including the reactor protection system (RPS).

A fault in the motor leads box on the inboard motor of the 'B' main feedwater pump was not isolated by the motor supply breaker resulting in the loss of the 'B' station service bus. The loss of power to 'B' station service bus caused a loss of the 'B' reactor coolant pump and subsequent reactor trip on low loop flow.

This event posed no significant safety implications because core cooling was maintained and all safety systems responded appropriately. Therefore, the health and safety of the public were not affected at any time during this event.

END OF ABSTRACT

TEXT PAGE 2 OF 4

1.0 Description of the Event

On January 27, 1995, at 1150 hours, 'A' main feedwater pump (MFWP) 1-FW-P-1A (EIS System-SJ, Component-P) was started for post - maintenance testing. The 'B' main feedwater pump, 1-FW-P-1B, was secured at 1204 hours and placed in auto. After several hours of operation, 'A' MFWP bearing temperatures increased to 188 degrees Fahrenheit (F) and the decision was made to shutdown the pump. At 1601 hours, an attempt was made to place the 'B' MFWP in service. When the inboard motor, 1B2 (EIS Component-MO) of the 'B' MFWP was re-started, an electrical ground fault occurred on Phase C at one of the motor lead mechanical connections inside the motor leads box. The fault was not isolated by the motor supply breaker, 15B6, (EIS Component-BKR) and the 'B' station service bus (EIS Component-BU) de-energized when the bus supply breaker 15B2 tripped. The failure of the feedwater pump motor breaker 15B6 resulted in the normal supply breaker 15B2 bus ground time overcurrent relay (EIS Component-51) operating as designed to isolate the fault. This loss of power caused the 'B' reactor coolant pump (EIS System-AB, Component-P) to trip resulting in a low flow condition in the 'B' reactor coolant loop and subsequent reactor trip. Prior to the trip there were no abnormal indications or annunciators in the control room.

Emergency procedure 1-E-0, Reactor Trip and Safety Injection (SI), was entered. At 1605 hours, transition was made to Emergency Procedure 1-ES-0.1, Post Trip Recovery.

On January 28, 1995, at 0008 hours, the 'B' station service bus was re-energized. Subsequently, the 'B' RCP was started and the reactor trip breakers were closed. Reactor start-up commenced at 1238 hours and Mode 2 was entered at 1257 hours. At 1746 hours, the unit entered Mode 1 and the process of returning the unit to 100 percent power commenced.

2.0 Significant Safety Consequences and Implications

This event posed no significant safety implications because core cooling was maintained and all safety systems responded appropriately.

Therefore, the health and safety of the public were not affected at any time during this event.

This event is reportable pursuant to 10 CFR 50.73 (a)(2)(iv) for a condition that resulted in an automatic actuation of any engineered safety feature (ESF), including the reactor protection system (RPS).

TEXT PAGE 3 OF 4

3.0 Cause of the Event

A fault in the motor leads box on the inboard motor of the 'B' main feedwater pump resulted in the 15B2 bus ground time overcurrent relay operating, as designed, for backup protection for this faulted motor lead. The loss of power to 'B' station service bus caused the loss of the 'B' reactor coolant pump and a subsequent reactor trip on low loop flow. The normal supply to the 'B' station service bus, breaker 15B2, tripped before the affected feedwater pump breaker 15B6. The automatic transfer to reserve station supply was locked out, as designed, due to the operation of the 15B2 protection scheme.

Following the event, it was verified that breaker 15B6 had opened without operator action. The 'B' station service bus undervoltage protection relay (EIIIS Component-27) was found to have actuated as designed following the loss of bus voltage due to the opening of the 15B2 breaker. Actuation of the undervoltage relay was as designed to trip selected breakers on 'B' station service bus including 15B6.

The motor ground fault protection relay (EIIIS Component-64) was found to have actuated with no confirmed actuation of the 15B6 lockout relay (EIIIS Component-86). Initial comprehensive testing and inspections immediately following the event could not duplicate the failure of the 15B6 breaker to open on ground fault relay actuation.

Probable cause for the failure of the 15B6 breaker to clear the fault was the failure of the lockout relay to actuate the breaker trip circuit on operation of the ground fault protection. Both the 86 relay and the motor supply breaker were replaced prior to returning the 1B2 motor to service as a preventative measure.

Probable cause for the ground fault was due to the degraded condition of a mechanical connection which led to high resistance in the circuit of the motor leads to 1-FW-P-1B.

4.0 Immediate Corrective Action

Emergency procedure 1-E-0, Reactor Trip and Safety Injection (SI), was entered. At 1605 hours, transition was made to Emergency Procedure 1-ES-0.1, Post Trip Recovery. Unit response during the event was normal. Initially, reactor coolant system (RCS) pressure decreased to approximately 1950 psig and RCS temperature decreased to approximately 543 degrees F. Pressurizer pressure, level and RCS temperature subsequently returned to their normal programmed levels. All ESF equipment responded as designed.

TEXT PAGE 4 OF 4

5.0 Additional Corrective Actions

The lockout relay (86 device), responsible for actuating the breaker 15B6 trip circuit, and the motor supply breaker were replaced prior to returning the 1-FW-P-1B motor 1B2 to service.

6.0 Actions to Prevent Recurrence

A Root Cause Evaluation was initiated on January 27, 1995, to investigate the fault on 1-FW-P-1B motor 1B2 leads, and the failure of the 1B2 motor supply breaker, 15B6, to isolate the fault. Upon completion of the evaluation corrective actions will be implemented as necessary.

7.0 Similar Events

None

8.0 Additional Information

Unit 2 was operating in Mode 1, 93.5 percent power in an end of cycle coastdown, and was not affected by this event.

ATTACHMENT TO 9502280424 PAGE 1 OF 1

10 CFR 50.73

Virginia Electric and Power Company
North Anna Power Station
P. O. Box 402
Mineral, Virginia. 23117

February 23, 1995

U. S. Nuclear Regulatory Commission NAPS:MPW

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Washington, D.C. 20555 License No. NPF-4

Dear Sirs:

Pursuant to North Anna Power Station Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report applicable to North Anna Unit 1.

Report No. 50-338/95-001-00

This Report has been reviewed by the Station Nuclear Safety and Operating Committee and will be forwarded to the Management Safety Review Committee for its review.

Very truly yours,

J. A. Stall
Station Manager

Enclosure:

cc: U.S. Nuclear Regulatory Commission
101 Marietta Street, N.W.
Suite 2900
Atlanta, Georgia 30323

R. D. McWhorter
NRC Senior Resident Inspector
North Anna Power Station

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